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### AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 4. (Cancelled).

5. (Currently amended) ~~The method of claim 4~~ A method of analyzing input information, comprising the steps of:

converting an input pattern consisting of cells into a converted pattern consisting of cells and storing the converted pattern;

calculating an activity level of a partial or whole set of cells of at least one of a plurality of stored patterns with respect to the converted pattern according to cell values of the stored patterns and the converted pattern;

repressing each of the calculated activity levels a predetermined number of times according to repression rules that are determined in consideration of a negative repression coefficient and the calculated activity levels of the stored patterns other than the converted pattern;

generating a new cell value for each cell of the at least one stored pattern according to a corresponding one of the cell values and a corresponding one of the repressed calculated activity levels; and

providing resultant cell values based on the new cell values as a response pattern for the input pattern,

wherein: the repressing step changes each activity level  $A(i)$  by  $\delta A(i)$  according to a repression coefficient  $W(i)$  as follows:

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$$\delta A(i) = W(i) \{ \psi(A(1)) + \psi(A(2)) + \dots \\ + \psi(A(i-1)) + \psi(A(i+1)) + \dots + \psi(A(M)) \}, \text{ and}$$

$$\psi(x) = \begin{cases} x & : x > 0 \\ 0 & : \text{else.} \end{cases}$$

6. - 10. (Cancelled).

11. (Currently amended) ~~The apparatus of claim 10~~ An apparatus for analyzing input information, comprising:

preprocessing means for converting an input pattern consisting of cells into a converted pattern consisting of cells and storing the converted pattern;

activity level calculating means for reading at least one of a plurality of stored patterns and calculating an activity level of a partial or whole set of cells of each of the read patterns according to cell values of the read patterns and the converted pattern;

mutual repressing means for repressing each of the calculated activity levels a predetermined number of times according to repression rules that are determined in consideration of a negative repression coefficient and the calculated activity levels of the read patterns other than the converted pattern;

generating a new cell value for each cell of the at least one stored pattern according to a corresponding one of the cell values and a corresponding one of the repressed calculated activity levels; and

output means for providing resultant cell values based on the new cell values as a response pattern for the input pattern,

wherein the mutual repressing means changes each activity level  $A(i)$  by  $\delta A(i)$  according to a repression coefficient  $W(i)$  as follows:

$$\delta A(i) = W(i) \{ \psi(A(1)) + \psi(A(2)) + \dots \\ + \psi(A(i-1)) + \psi(A(i+1)) + \dots + \psi(A(M)) \}, \text{ and}$$

$$\psi(x) = \begin{cases} x & : x > 0 \\ 0 & : \text{else.} \end{cases}$$

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12. – 14. (Cancelled).

15. (Currently amended) ~~The method of claim 4~~ A method of analyzing input information, comprising the steps of:

converting an input pattern consisting of cells into a converted pattern consisting of cells and storing the converted pattern;

calculating an activity level of a partial or whole set of cells of at least one of a plurality of stored patterns with respect to the converted pattern according to cell values of the stored patterns and the converted pattern;

repressing each of the calculated activity levels a predetermined number of times according to repression rules that are determined in consideration of a negative repression coefficient and the calculated activity levels of the stored patterns other than the converted pattern;

generating a new cell value for each cell of the at least one stored pattern according to a corresponding one of the cell values and a corresponding one of the repressed calculated activity levels; and

providing resultant cell values based on the new cell values as a response pattern for the input pattern,

wherein one of a plurality of similarity levels of the cells for a focal range of one cell of the partial or whole set of cells is calculated as follows:

$$S_H(i,k) = \sum_{L_k \in H_{sk}} P(k) \cdot T(i,k) / N_k.$$

wherein  $S_H(i,k)$  represents the similarity level,  $L_k$  represents a cell contained in a given similarity range  $H_{sk}$ ,  $P(k)$  represents a cell value in the input pattern,  $T(i,k)$  represents a cell value in trace  $i$ , and  $N_k$  represents a number of related cells.

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16. (Previously presented) The method of claim 15,

wherein a repression range is set for the focal range and a new pattern is calculated as

follows: 
$$C_H(j) = \sum_{i=1}^M \sum_{L_k \in I_j} \Psi(A_H(i, k)) \cdot T(i, k).$$

wherein  $C_H(j)$  represents the new pattern,  $L_k$  represents a cell contained in a given repression range  $I_j$ ,  $A_H(i, k)$  represents an activity level of a cell  $k$  in trace  $i$ ,  $T(i, k)$  represents

a cell value in trace  $i$ , and  $\psi(x) = \begin{cases} x & : x > 0 \\ 0 & : \text{else.} \end{cases}$

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17. (Currently amended) ~~The method of claim 4~~ A method of analyzing input information, comprising the steps of:

converting an input pattern consisting of cells into a converted pattern consisting of cells and storing the converted pattern;

wherein calculating a similarity level of a cell in a similarity range containing a focal range of one cell of the a partial or whole set of cells is calculated of at least one of a plurality of stored patterns with respect to the converted pattern according to cell values of the stored patterns and the converted pattern;

calculating an activity level of the partial or whole set of cells;

repressing each of the calculated activity levels a predetermined number of times according to repression rules that are determined in consideration of a negative repression coefficient and the calculated activity levels of the stored patterns other than the converted pattern;

generating a new cell value for each cell of the at least one stored pattern according to a corresponding one of the cell values and a corresponding one of the repressed calculated activity levels; and

providing resultant cell values based on the new cell values as a response pattern for the input pattern.

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18. (Currently amended) The method of claim 17, wherein the similarity level of a the cell in the first similarity range depends on a distance from the focal range to the cell in the similarity range.

19. (Currently amended) The method of claim 17,  
wherein a repression coefficient applied to a cell in a repression range containing the focal range depends on a distance from the focal range to the cell in the repression range.

20. – 21. (Cancelled).